

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GLOBAL FOUNDRIES U.S., INC., GLOBALFOUNDRIES DRESDEN  
MODULE ONE LLC & CO. KG, GLOBALFOUNDRIES DRESDEN MODULE  
TWO LLC & CO. KG, and THE GILLETTE COMPANY,

Petitioners

v.

ZOND, LLC  
Patent Owner

Case No. IPR2014-01089<sup>1</sup>

Patent 6,806,652 B2

**DECLARATION OF LARRY D. HARTSOUGH, PH.D.**

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<sup>1</sup> Case IPR 2014-01004 has been joined with the instant proceeding.

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I, Larry D. Hartsough, do hereby declare:

1. I am making this declaration at the request of patent owner Zond, LLC, in connection with the *Inter Partes* Reviews (IPRs) of U.S. Patent No. 6,806,652 (the “‘652 patent”), set forth in the above caption.

2. I am being compensated for my work in this matter at the rate of \$300 per hour. I have no interest in the ‘652 patent and my compensation in no way depends on the outcome of this proceeding.

3. In forming the opinions set forth in this declaration I reviewed a number of materials, including the ‘652 patent, the file history of the ‘652 patent, the Petitions for *Inter Partes* Review and the cited references discussed below, the Patent Trial and Appeal Board’s (PTAB’s) Institution Decisions in these IPR proceedings, the transcript of the deposition of Dr. Uwe Kortshagen concerning the ‘652 patent, and the additional materials discussed herein.

## **I. EDUCATION AND PROFESSIONAL BACKGROUND**

4. My formal education is as follows. I received a Bachelors of Science degree in 1965, Master of Science degree in 1967, and Ph.D. in 1971, all in Materials Science/Engineering from the University of California, Berkeley.

5. I have worked in the semiconductor industry for approximately 30 years. My experience includes thin film deposition, vacuum system design, and plasma processing of materials. I made significant contributions to the development of magnetron sputtering hardware and processes for the metallization of silicon integrated circuits. Since the late 1980s, I have also been instrumental in the development of standards for semiconductor fabrication equipment published by the Semiconductor Equipment and Materials International (“SEMI”) trade organization.

6. From 1971-1974, I was a research metallurgist in the thin film development lab of Optical Coating Laboratory, Inc. In 1975 and 1976, I developed and demonstrated thin film applications and hardware for an in-line system at Airco Temescal. During my tenure (1977-1981) at Perkin Elmer, Plasma Products Division, I served in a number of capacities from Senior Staff Scientist, to Manager of the Advanced Development activity, to Manager of the Applications Laboratory. In 1981, I co-founded a semiconductor equipment company, Gryphon Products, and was VP of Engineering during development of the product. From 1984-1988, I was the Advanced Development Manager for Gryphon, developing new hardware and process capabilities. During 1988-1990, I was Project Manager at General Signal Thinfilm on a project to develop and prototype an advanced cluster tool for making thin films. From 1991-2002, I was Manager of PVD

(physical vapor deposition) Source Engineering for Varian Associates, Thin Film Systems, and then for Novellus Systems, after they purchased TFS. Since then, I have been consulting full time doing business as UA Associates, where my consulting work includes product development projects, film failure analysis, project management, technical presentations and litigation support.

7. Throughout my career, I have developed and/or demonstrated processes and equipment for making thin films, including Al, Ti-W, Ta, and Cu metallization of silicon wafers, RF sputtering and etching, and both RF and DC magnetron reactive sputtering, for example SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, ITO (Indium-Tin Oxide), TiN, and TaN. I have been in charge of the development of two sputter deposition systems from conception to prototype and release to manufacturing. I have also specialized in the development and improvement of magnetically enhanced sputter cathodes. I have experience with related technology areas, such as wafer heating, power supply evaluation, wafer cooling, ion beam sources, wafer handling by electrostatics, process pressure control, in-situ wafer/process monitoring, cryogenic pumping, getter pumping, sputter target development, and physical, electrical and optical properties of thin films.

8. I am a member of a number of professional organizations including the American Vacuum Society, Sigma Xi (the Scientific Research Society), and as a

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